Research Note

Chromosomal number of two species of bivalves: *Brachidontes darwinianus* (d'Orbigny, 1842) (Mytilidae) and *Isognomon bicolor* (C.B. Adams, 1845) (Isognomonidae)

INTRODUCTION

Brachidontes darwinianus is a common species in estuaries and occurs attached to rocks in the intertidal zone of rocky shores from the state of Rio de Janeiro in Brazil, to Patagonia in Argentina (Rios, 1995), although Blanco (1966) stated that this species was found from the state of Bahia (Todos os Santos Bay), Brazil, to the mouth of the Río de La Plata, Argentina. *Brachidontes darwinianus* shows marked phenotypic plasticity, with considerable variation in shell shape, depending on where the specimens are collected. This plasticity makes shell morphology a questionable criterion for taxonomic studies (Nalesso et al., 1992; Tanaka and Magalhães, 1999).

Isognomon bicolor, a bivalve with a wide geographic distribution throughout many countries in the Americas (Domaneschi and Martins, 2002), is commonly found attached by its byssus to jetty pilings or growing in crevices on rocky shores, often in areas with strong water currents. Although most isognomonids found in Brazil have been classified as *I. alatus* and *I. radiatus*, Domaneschi and Martins (2002) stated that all of these samples effectively belong to *I. bicolor*. Indeed, the occurrence of *I. alatus* and *I. radiatus* has not been confirmed in that country.

The analysis of chromosomal numbers has been used to complement other methods of identifying species (Gosling, 1992). The aim of this work was to examine and describe the Giemsa-stained karyotype of the intertidal bivalves *B. darwinianus* and *I. bicolor*, and to compare the findings with corresponding data for other bivalve species.

MATERIALS AND METHODS

Specimens were collected from populations in Ubatuba Bay, on the coast of São Paulo state in southeastern Brazil, as follows: *Brachidontes darwinianus* from Praia Dura (23°29′36.9″ S, 45°09′54.1″ W) and *Isognomon bicolor* from Praia da Fortaleza (23°31′51.5″ S, 45°09′34.4″ W.)

These animals were maintained in the laboratory in aerated seawater at 20°C for two weeks and were fed a suspension of algal cells (*Isochrysis galbana* and *Tetraselmis suecica*) to increase the number of mitotic divisions. The voucher specimens were deposited at the Museu de Zoologia "Prof. Adão José Cardoso" (ZUEC) at the State University of Campinas (UNICAMP), São Paulo, Brazil, under the accession numbers 1444 (*Isognomon*) and 1473 (*Brachidontes*).

Chromosomal Preparation and Staining: Following treatment with colchicine (0.005%) for 10 h, the bivalves were briefly rinsed in clean seawater and the gills were removed. The tissue was immersed in 0.8% sodium citrate solution for 50 min and fixed in Carnoy's solution for 1 h at 4°C. The chromosomes were prepared by dissociating the gill tissue in 30% acetic acid on heated (43°C) slides followed by staining with 10% Giemsa solution (pH 6.8) for 10 min.

RESULTS

All *Brachidontes darwinianus* specimens had a diploid number of 2n=30 chromosomes. The karyotype consisted of two pairs of metacentric chromosomes, two pairs of subtelocentric chromosomes and 11 pairs of telocentric chromosomes (Figure 1). A diploid number of 2n=28 was observed for five individuals of *Isognomon bicolor* (Figure 2).

DISCUSSION

***Brachidontes darwinianus*:** Extensive cytogenetic studies of the Mytilidae have allowed accurate cytotaxonomic comparisons among the species in this family (Thiriot-Quiévreux, 2002). The diploid chromosome number of 2n=30 found in *Brachidontes darwinianus* has been reported in only six other mytilid species so far, namely, *Musculista senhousia* (by Ieyama, 1977), *Brachidontes recurvus* (by Diupotex-Chong, 1978), *Hormomya mutabilis* (by Ieyama et al., 1994), *Limnoperna fortunei* (by Ieyama, 1996), *Perna canaliculus* (by Libertini et al., 1996), and *Choromytilus chorus* (by Palma-Rojas et al., 1997). Only four species of the genus *Brachidontes* have been studied to date: *B. recurvus* (2n=30; mentioned above), *B. pharaonis* (2n=28; Vitturi et al., 2000), *B. minimus* (2n=28; Thiriot-Quiévreux, 2002) and *Brachidontes rodriguezi* (2n=32; Torreiro et al., 1999). The karyotype of *B. darwinianus* is unusual for bivalves because it contains only two pairs of metacentric chromosomes, with the other 13 pairs being subtelocentrics or telocentrics. The occurrence of species with subtelocentric and telocentric chromosomes is uncommon in the Mytilidae (Torreiro et al., 1999, Thiriot-Quiévreux, 2002). Overall, *Brachidontes darwinianus* showed the same chromosomal

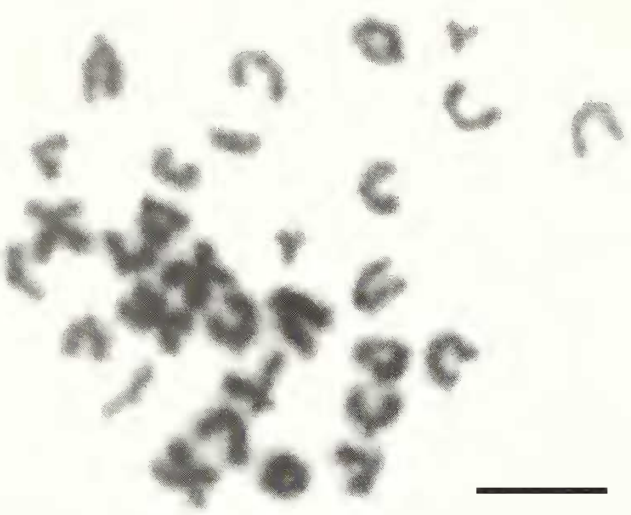

Figure 1. Mitotic metaphase of *Brachidontes darwinianus*. Scale bar = 5 μm.

number as *B. recurvus* and had a chromosomal morphology similar to that of *B. rodriguezi*, i.e. only two metacentric pairs and a predominance of subtelocentric and telocentric chromosomes.

***Isognomon bicolor*:** Squashed and air-dried preparations have been used to study chromosomes in species of the genera *Isognomon* and *Pinctada*, although the chromosomal number has been determined for only a few species of the Pterioidea (Wada, 1978; Rodríguez et al., 1983). The chromosomal number of 2n=28 here observed for this species coincided with those of the pterioidean species *I. alatus*, *Pinctada fucata*, and *P. imbricata*. These results provide an additional example of a tendency towards a stable chromosomal number in the Isognomonidae and Pteridae, and in the superfamily Pterioidea.

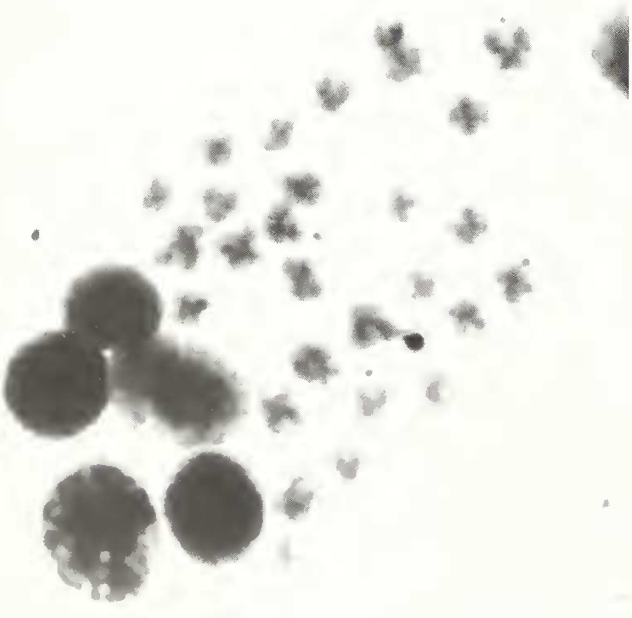

Figure 2. Mitotic metaphase of *Isognomon bicolor*, Giemsa staining. Scale bar = 5 μm.

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